

Neue und interessante Milben
aus dem Genfer Museum LII.
Oribatids from Mauritius, Réunion
and the Seychelles III (Acari: Oribatida)

by

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With 79 figures

ABSTRACT

New and interesting mites from the Geneva Museum LII. Oribatids from Mauritius, Réunion and the Seychelles III (Acari: Oribatida). — Thirty seven species are recorded from Mauritius, Réunion and Seychelles Islands. Twenty new species and two new genera are described: *Philotritia* gen. n. (*Oribotritiidae*) and *Berndia* gen. n. (*Oribatulidae*). Zoogeographical considerations on the Oribatid fauna of this region are given.

INTRODUCTION

I have already reported in two previous works (MAHUNKA 1978*a, b*) on the results of investigations carried out on the mite materials extracted from Berlese samples that have been collected by Dr. P. Schauenberg, former Research Officer at the Muséum d'histoire naturelle de Genève, in Mauritius, Réunion and the Seychelles ¹. So far only a small part of the material has been examined. Recently a longer series has been the object of my study, partly to receive more material of some recently described species. This time I lay special stress on the primitive groups of *Archoribatida* which are particularly useful for furthering our joint effort (BALOGH & MAHUNKA 1983) of a world monograph. 37 species

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have been identified, of which 20 proved to be new to science, two species could not be placed into any of the so far known genera, consequently, two new genera had to be erected for them (*Philotritia* and *Berndia*). Several species have been already known, but four are recorded for the first time from this faunal region [*Heptacarus reticulatus* Mahunka, 1977, *Javacarus porosus* Hammer, 1979, *Archiphthiracarus hamatus* (Hammer, 1973) comb. nov. and *Indotritia krakatauensis* (Sellnick, 1923)]. In spite of many new data, the final elaboration of the material is far from being complete, even several systematical questions are still pending, e.g. the problem of the earlier indicated *Meristacarus madagascarensis* Balogh, 1962, which species will either have to be deleted from the list or perhaps will have to be substituted by a subspecies to be described in the future. A further problem is the again recovered *Torpacarus* cf. *omittens* Grandjean, 1950 (not referred to henceforth). Of course, these questions can only be answered after a study of the respective type materials.

Herewith I should like to thank Dr. B. Hauser, head of the Arthropoda Section of the Geneva Museum, for allowing me to study this most interesting material.

ZOOGEOGRAPHICAL COMMENTS

Geographically the islands whence the Oribatida materials originate are quite close to the mainland of Africa, and especially to Madagascar. Therefore it seems quite logical to suppose that the fauna of these islands must be highly similar to the fauna of these regions. Unfortunately, however, this cannot be proved since a prerequisite would be a good knowledge of the fauna of the compared regions. Data and papers are rather sporadic (BALOGH 1959, 1960, 1961, 1962a, b; EVANS 1953; MAHUNKA 1969). Thus, any reliable evaluation is impossible for the time being. In spite of this results of the present investigations unequivocally indicate several connections.

First and foremost a high degree of relationship may be established between the fauna of these islands and that of the Oriental Region, and the same is perhaps even more valid for the Pacific Region. On the other hand, the relationship with the Malagassy and the Ethiopian regions is not even approaching the degree expected.

The geographical distribution of the species excluding the new ones, the circum-tropical and cosmopolitan ones:

Oriental-Pacific Region

Cryptacarus hirsutus Aoki, 1961
Heptacarus reticulatus Mahunka, 1977
Javacarus porosus Hammer, 1979
Archiphthiracarus hamatus (Hammer, 1973)
Hoplophorella scapellata Aoki, 1965
Indotritia krakatauensis (Sellnick, 1923)
Machuella zehntneri Mahunka, 1976
Striatoppia opuntiseta Balogh et Mahunka, 1968
Suctobelba variosetosa Hammer, 1961
Perxylobates vermiseta Balogh et Mahunka, 1968
?Galunna flabellifera Hammer, 1958

Ethiopian region

Annectacarus africanus Balogh, 1961
Nanhermannia milotti Balogh, 1960
Nodocephus hammerae Balogh, 1961
Machadocephus longus Balogh, 1962
Micreremus africanus Balogh, 1963
Rykella insignis Balogh, 1962

Besides the identity of the species — at such great geographical distances — the presence of parallel genera is perhaps even more striking:

Clavazetes Hammer, 1966
Nesotocepheus Hammer, 1972
Arthrovertex Balogh, 1970
Brachyoripoda Balogh, 1970
Protoripoda Balogh, 1970

These genera with their respective species have been found exclusively in the Oriental-Pacific Region!

This may be explained in several ways: the common Gondwana origin, the conditions of prevailing currents in these regions (wind, etc.), the ancient shipping lines between South-east Asia and Africa. Obviously, the final analysis and conclusions can be made only after being fully acquainted with the faunae concerned. The still expected large number of taxa would certainly significantly modify any actual suggestion.

LIST OF LOCALITIES

Mauritius

- Mau-75/4: Maurice: Ile aux Aigrettes, sous couche de feuilles d'arbres endémiques, 24.XII.1974.
Mau-75/5: Maurice: près de Pétrin, forêt vierge de Macchabée (peuplement de Sapotacées endémiques) alt. 700 m, 26.XII.1974.
Mau-75/40: Maurice: Ile des Aigrettes, 24.XII.1974.
Mau-75/42: Maurice: Forêt de Macchabée, alt. 700 m, 26.XII.1974.
Mau-75/48: Maurice: Flanc O. Tourelle de Tamarin, alt. 150 m, 31.XII.1974.

Réunion

- Mau-75/8: La Réunion: Sommet de La Roche-Ecrite, alt. 2277 m, 8.I.1975.
Mau-75/9: La Réunion: Plaine des Chicots, alt. 1850 m, 9.I.1975.
Mau-75/20: La Réunion: Saint-Philippe, forêt de palmiers, alt. 20 m, 19.I.1975.
Mau-75/57: La Réunion: Forêt primitive endémique de la Grande Chaloupe, alt. 430 à 590 m, 11.I.1975.
Mau-75/58: La Réunion: Basse-Vallée forêt endémique, alt. env. 700 m, 13.I.1975.
Mau-75/60: La Réunion: Saint-Philippe, 14/15.I.1975.
Mau-75/61: La Réunion: Saint-Philippe, 15.I.1975.

Seychelles

- Mau-75/27: Seychelles: Mahé, La Blache Bay, 26.I.1975.
Mau-75/28: Seychelles: Mahé, Jardin botanique de Victoria, 27.I.1975.
Mau-75/29: Seychelles: Ile Praslin, Vallée de Mai (peuplement de Cocos de mer), 28.I.1975.
Mau-75/30: Seychelles: Ile La Digue, 28.I.1975.
Mau-75/31: Seychelles: Bird Island, 29.I.1975.
Mau-75/32: Seychelles: Ile Cousin, 31.I.1975.

LIST OF IDENTIFIED SPECIES

Hypochthoniidae Berlese, 1910*Malacoangelia remigera* Berlese, 1913

Localities: Mau-75/4: 3 specimens; Mau-75/40: 10 specimens

Mesoplophoridae Ewing, 1917*Mesoplophora gibba* n. sp.

Localities: Mau-75/28; Mau-75/29

Lohmanniidae Berlese, 1916*Annectacarus africanus* Balogh, 1961

Localities: Mau-75/28: 1 specimen; Mau-75/29: 1 specimen

Cryptacarus hirsutus Aoki, 1961Localities: Mau-75/20: 3 specimens; Mau-75/30: 2 specimens; Mau-75/60: 1 specimen;
Mau-75/61: 1 specimen*Heptacarus reticulatus* Mahunka, 1977

Locality: Mau-75/28: 2 specimens

Javacarus porosus Hammer, 1979

Localities: Mau-75/20: 1 specimen; Mau-75/28: 5 specimens; Mau-75/29: 5 specimens

Lohmannia embryonalis Mahunka, 1978

Localities: Mau-75/30: 2 specimens; Mau-75/42: 1 specimen

Phthiracaridae Perty, 1841*Archiphthiracarus foveolatus* n. sp.

Locality: Mau-75/58.

Archiphthiracarus hamatus (Hammer, 1973) comb. nov.

Locality: Mau-75/58: 1 specimen

Archiphthiracarus hauseri n. sp.

Localities: Mau-75/8, Mau-75/9

Archiphthiracarus schauenbergi n. sp.

Localities: Mau-75/31; Mau-75/42

Hoplophorella minisetosa Mahunka, 1978

Localities: Mau-75/42: 5 specimens; Mau-75/58: 30 specimens

Hoplophorella reducta n. sp.

Locality: Mau-75/58

Hoplophorella scapellata Aoki, 1965

Locality: Mau-75/57: 3 specimens

Hoplophorella schauenbergi Mahunka, 1978

Localities: Mau-75/31: 20 specimens; Mau-75/48: 7 specimens

Hoplophthiracarus atypicus n. sp.

Localities: Mau-75/5; Mau-75/58

Hoplophthiracarus magnus n. sp.

Localities: Mau-75/57; Mau-75/60

Hoplophthiracarus regalis Mahunka, 1978

Locality: Mau-75/32: 2 specimens

Hoplophthiracarus trichosus n. sp.

Localities: Mau-75/5; Mau-75/42

Phthiracarus clavifer n. sp.

Localities: Mau-75/58; Mau-75/61

Steganacarus multirugosus Mahunka, 1978

Locality: Mau-75/58: 40 specimens

Oribotritiidae Grandjean, 1954

Indotritia krakatauensis (Sellnick, 1923) (Figs 36-37)

Localities: Mau-75/4: 8 specimens; Mau-75/27: 20 specimens; Mau-75/30: 4 specimens;
Mau-75/40: 7 specimens; Mau-75/60: 100 specimens; Mau-75/61: 50 specimens

Philotritia spinosa n. gen., n. sp.

Localities: Mau-75/5; Mau-75/60

Euphthiracaridae Jacot, 1930

Microtritia ethiopica n. sp.

Locality: Mau-75/28

Otocephidae Balogh, 1961

Clavazetes tuberculatus Mahunka, 1978

Locality: Mau-75/58: 2 specimens

Dolicheremaeus plurisetus n. sp.

Locality: Mau-75/58

Nesotocephus clavigerus Mahunka, 1978

Locality: Mau-75/58: 1 specimen

Pseudotocephus transversalis Mahunka, 1978

Locality: Mau-75/57: 3 specimens

Scutoverticidae Grandjean, 1954

Arthrovertex xena n. sp.

Localities: Mau-75/40; Mau-75/60

Oribatulidae Thor, 1929

Aellenobates cryptacus Mahunka, 1978

Locality: Mau-75/58: 9 specimens

Aellenobates sculpturatus n. sp.

Locality: Mau-75/61

Berndia setosa n. gen., n. sp.

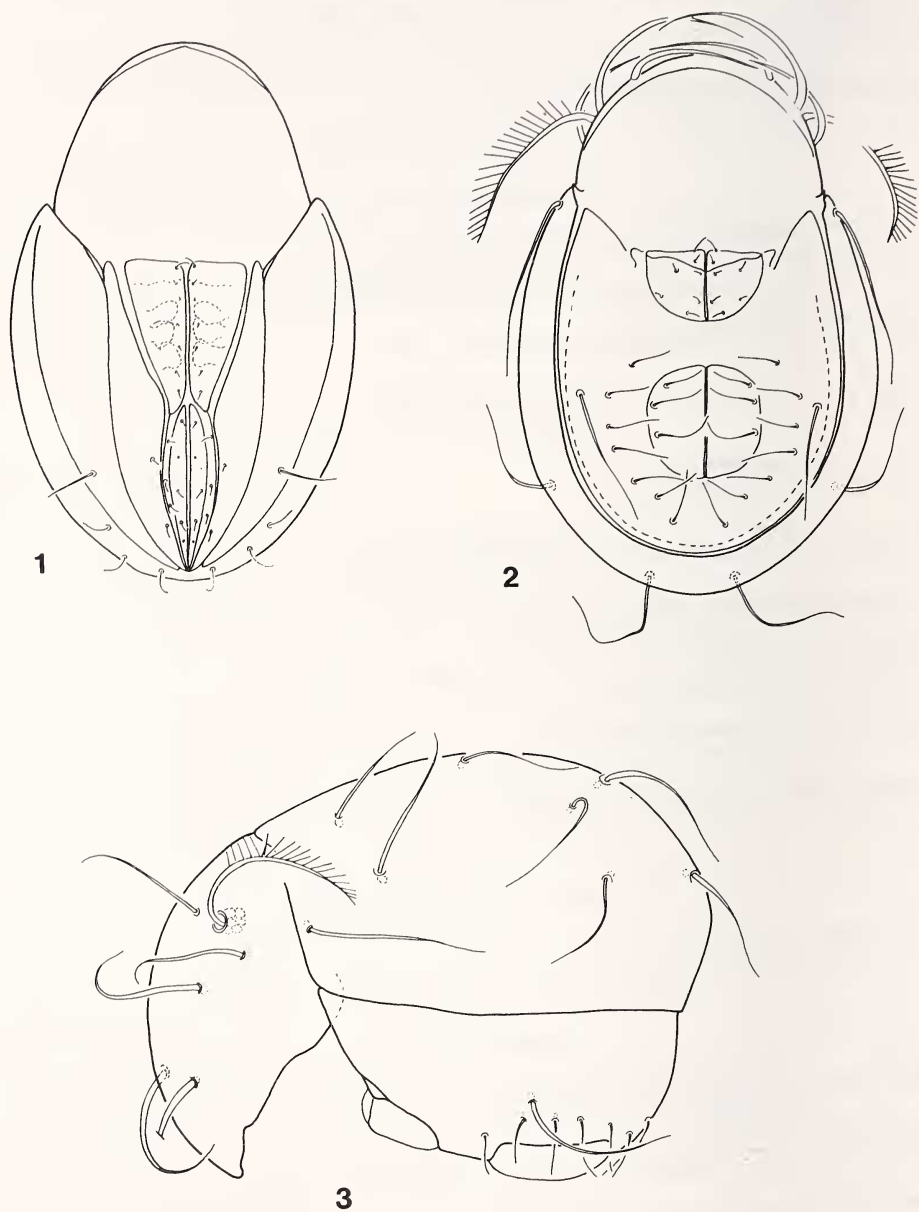
Localities: Mau-75/60; Mau-75/61

Euscheloribates clavisetus n. sp.

Locality: Mau-75/58

Scheloribates schauenbergi n. sp.

Localities: Mau-75/58; Mau-75/61



FIGS 1-3.

Mesoplophora gibba n. sp. — 1: ventral side (nymph), 2: ventral side (imago), 3: lateral side.

Oripodidae Jacot, 1925

Brachyoripoda minima n. sp.

Locality: Mau-75/40

Protoripoda lineata n. sp.

Locality: Mau-75/40

Protoripoda tuberculata n. sp.

Locality: Mau-75/40

DESCRIPTIONS

Mesoplophora gibba n. sp.

Measurements: Length of aspis: 168-178 μm , length of notogaster: 228-247 μm .

Lateral view (Fig. 3): Great differences existing among setae of aspis, interlamellar one much thinner and shorter than all others, especially lamellar one robust. Sensillus strikingly thick, pectinate, bearing 20 very long lateral branches. Notogaster with 8 setae of various length and thickness, among them c_3 the longest.

Ventral view (Fig. 2): "Ventral" plate emitting 8 pairs of setae, aggenital region bald without setae. 7 pairs of genital and 3 pairs of anal setae present.

Legs: With one claw each.

Material examined: Holotype: Mau-75/29, 6 (5 adults, 1 nymph) paratypes: same data as for holotype, 1 paratype: Mau-75/28. Holotypus and 5 paratypes: MHNG², 2 paratypes (612-PO-81): HNHM³.

Remarks: Among the known species of the genus the new species stands closest to *Mesoplophora leviseta* Hammer, 1979 described from Java. However, the lateral branches of the sensillus of the latter species are scarcely longer than the diameter of the petiole, seta c_3 is much shorter than c_2 , and beside the genital plate a well discernible pair of seta is present.

Heptacarus reticulatus Mahunka, 1977

While identifying a series of this species originating from the Seychelles I had to reexamine the holotype also, since in the original description I left out of consideration a closely allied species known as *H. supertrichus* Piffel, 1966, and a further one: *H. hirsutus* Wallwork, 1964 which latter however, had not been compared with PIFFEL's species.

The three species can be separated with certainty only after the examination of the types, they most likely are valid species. For the time being the following differences among them may be established:

² MHNG = deposited in the Muséum d'histoire naturelle, Genève.

³ HNHM = deposited in the Hungarian Natural History Museum, Budapest, with identification number of the specimens in the Collection of Arachnida.

	<i>hirsutus</i>	<i>supertrichus</i>	<i>reticulatus</i>
seta c_1 reaching origin of d_1	no	yes	no
rostral, interlamellar and lamellar setae	with separate cilia	penicillately ciliate	with separate cilia
origin of neotrichy	beyond the seta e	beyond setae d	beyond seta e
relation of anal-adanal setae	an_2 $\frac{1}{3}$ of ad_5	an_2 only $\frac{1}{4}$ of ad_5	an_2 $\frac{1}{5}$ of ad_5
relation of anal setae	an_1 half of an_2	both short but equal	an_1 scarcely shorter than an_2
anal setae	straight	straight	an_1 reclinate, an_2 straight

Archiphthiracarus foveolatus n. sp.

Measurements: Length of aspis: 143-154 μm , length of notogaster: 267-292 μm , height of notogaster: 163-188 μm .

Aspis (Fig. 5): In lateral view strongly convex at base and at the height of rostral setae, between these two straight. At rostrum deeply sinuate. Prodorsal setae of equal length, *exa* represented only by insertion points, setae *le* originating well in front of *in*, set close to each other (closer than rostral ones). Lateral margin of aspis becoming obsolete towards rostrum. Bothridium emitting a thin line towards margin. Sensillus long and falciform.

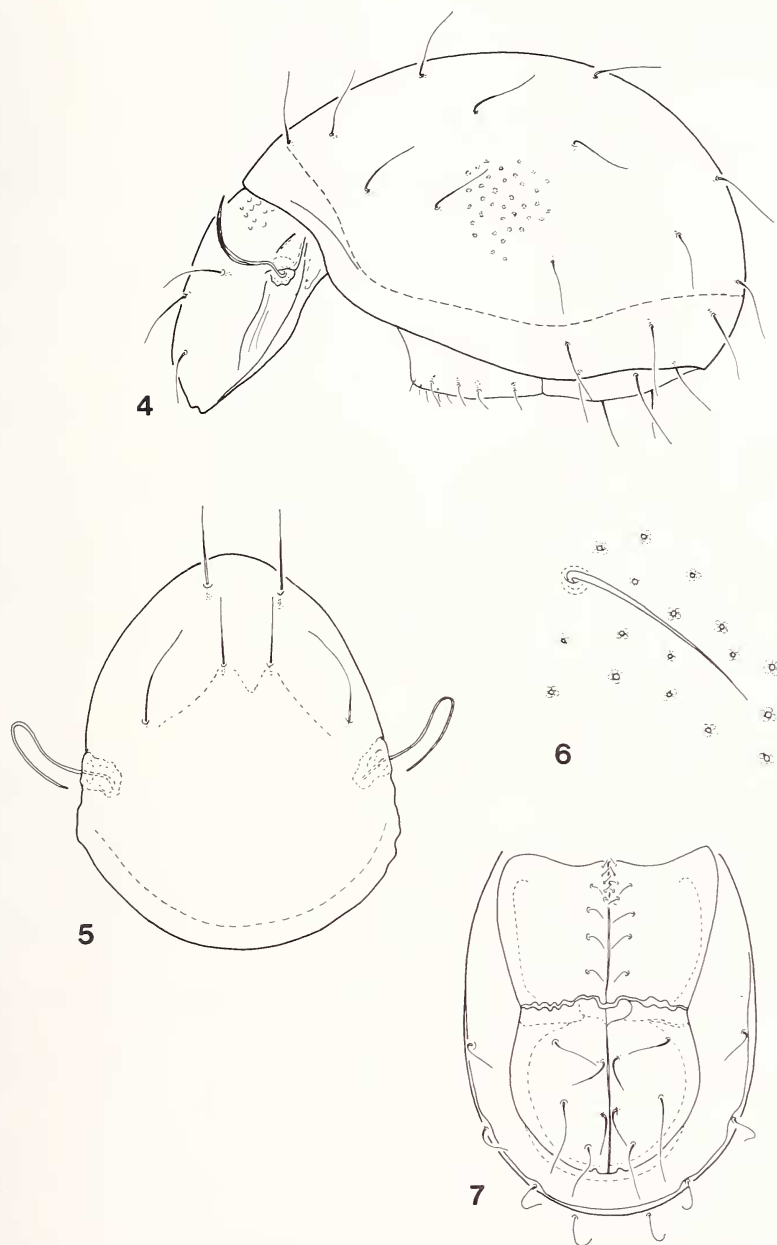
Notogaster (Fig. 4): Having a very characteristic sculpture comprising groups of five foveolae, these however on the surface confluent into one porus. 15 pairs of thin notogastral setae, all directed caudally. Seta c_1 sitting on collar-line, c_2 and c_3 of equal length. Position of fissures and reduced f_1 - f_2 setae was impossible to determine.

Anogenital region (Fig. 7): Anal setae shorter than adanal ones, among them ad_2 slightly longer than other two.

Legs: Fore femur bearing 3 setae. Genu of leg IV without setae.

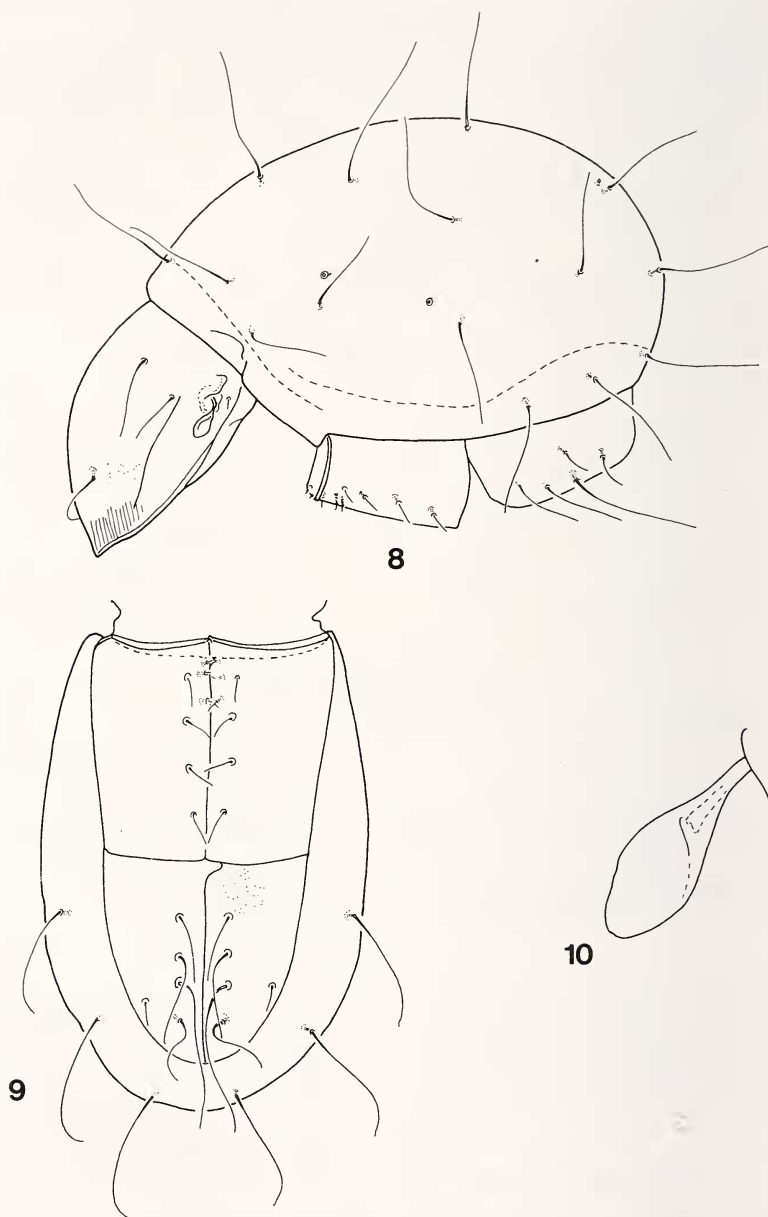
Material examined: Holotype: Mau-75/58, 6 paratypes: data same as for holotype. Holotype and 4 paratypes: MHNG, 2 paratypes (613-PO-81): HNHM.

Remarks: It is a unique species owing to its very characteristic sculpture and the position of setae on aspis.



FIGS 4-7.

Archiphthiracarus foveolatus n. sp. — 4: lateral side, 5: aspis, 6: seta *cp*, 7: anogenital region.



FIGS 8-10.

Archiphthiracarus hauseri n. sp. — 8: lateral side, 9: anogenital region, 10: sensillus.

***Archiphthiracarus hauseri* n. sp.**

Measurements: Length of aspis: 193-218 μm , length of notogaster: 376-411 μm , height of notogaster: 238-257 μm .

Aspis (Fig. 8): A fine margin well discernible. Bothridium emitting a well discernible line towards margin. Rostral part finely aciculated, otherwise surface punctate. Rostral setae somewhat more robust than others, though lamellar ones longer. Exobothridial setae represented only by alveoli. Sensillus (Fig. 10) phylliform.

Notogaster: 15 pairs of very fine, filiform notogastral setae present, c_1 originating on collar-line, f_1 and f_2 represented only by insertion points. Fissures *ia* and *im* readily discernible.

Anogenital region (Fig. 9): 9 pairs of genital, 5 pairs of anogenital setae present. ad_2 occasionally represented only by insertion point.

Material examined: Holotype: Mau-75/9, 9 paratypes: some data as for holotype, 1 paratype: Mau-75/8. Holotype and 7 paratypes: MHNG, 3 paratypes (614-PO-81): HNHM.

Remarks: The species differs by the position of the setae on the anoadanal plate from all species of the genus *Archiphthiracarus* Balogh et Mahunka, 1979: the anal setae arise beside the inner margin of the plate, while the adanal ones are always situated more inside. This character would qualify the taxon to be subgeneric rank, but as long as a full revision of the group does not exist I decline to describe a new subgenus. The new species is easily separable from all other known representatives of the genus.

Dedication: I would like to dedicate the new species as a sign of gratitude to my friend D. B. Hauser (Geneva) who organized an international soil zoological research.

***Archiphthiracarus schauenbergi* n. sp.**

Measurements: Length of aspis: 228-238 μm , length of notogaster: 450-461 μm , breadth of notogaster: 297-308 μm .

Aspis (Fig. 12): Convex in lateral view, but basal half sinuate. Rostrum in front weakly convex between rostral setae. Bothridium emitting well discernible line towards the margin, surface here longitudinally aciculated. All setae of aspis very fine, those of *in* and *le* approximately of equal length, exobothridial one longer than rostral seta.

Notogaster (Fig. 11): All notogastral setae very fine, somewhat inclinate towards caudal end. Seta c_1 emitted far from collar-line, this distance equalling width of collar; c_2 closer, c_3 emitted on collar-line. Fissures *ips* and *in* missing.

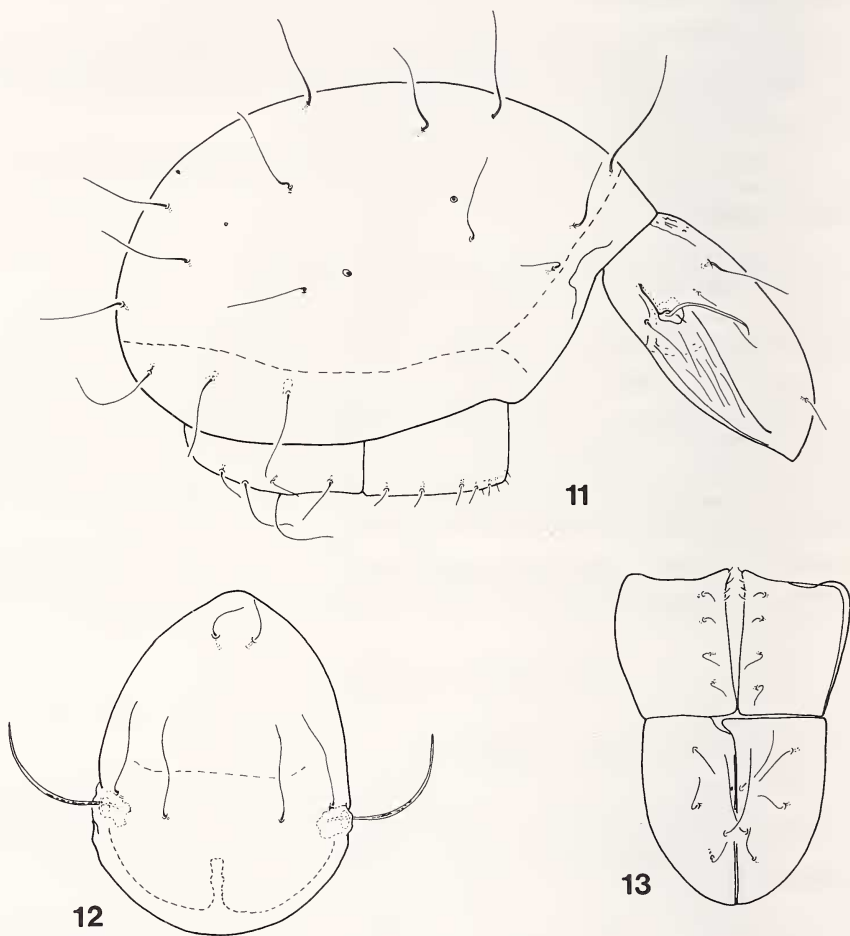
Anogenital region (Fig. 13): Anal setae much longer than adanal ones, all thin. ad_3 somewhat longer than either ad_1 or ad_2 .

Legs: Femur of leg I with 3 setae, genu of leg IV with 1 seta

Material examined: Holotype: Mau-75/42, 1 paratype: collected together with holotype, 1 paratype: Mau-75/31. The holotype and 1 paratype: MHNG, 1 paratype (615-PO-81): HNHM.

Remarks: Within the genus *Archiphthiracarus* Balogh et Mahunka, 1979 the new species belongs to the species-group which characterised by reduced leg chaetotaxy and missing fissure *ips*. However, the new species differs from its relatives by its setiform sensillus, the aciculated lateral surface of aspis and the conically convex rostrum.

D e d i c a t i o n : The new species is dedicated to Dr. P. Schauenberg, collector of this most valuable material.



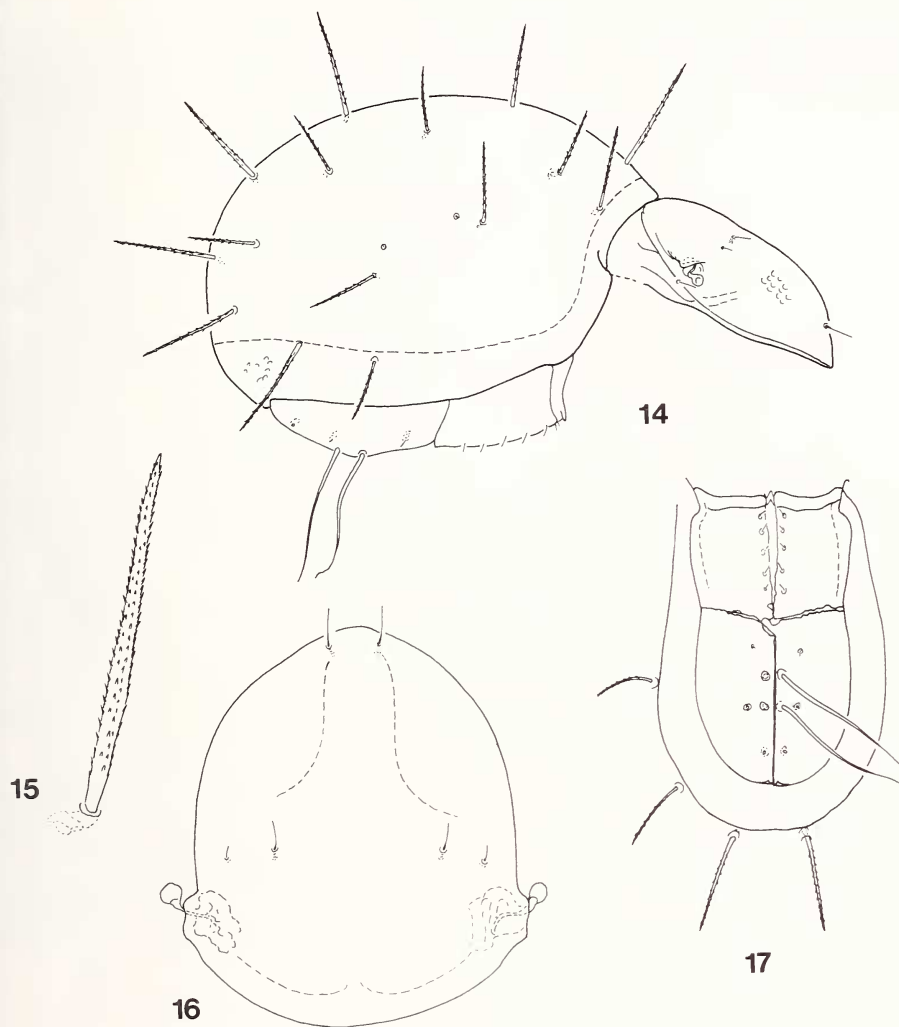
FIGS 11-13.

Archiphthiracarus schauenbergi n. sp. — 11: lateral side, 12: aspis, 13: anogenital region.

Hoplophorella reducta n. sp.

M e a s u r e m e n t s : Length of aspis: 292 μm , length of notogaster: 569 μm , height of notogaster: 376 μm .

A s p i s (Fig. 16): In lateral view strongly convex in front and at basal part, in the middle straight. Setae of aspis very short, among them rostral one the longest,



FIGS 14-17.

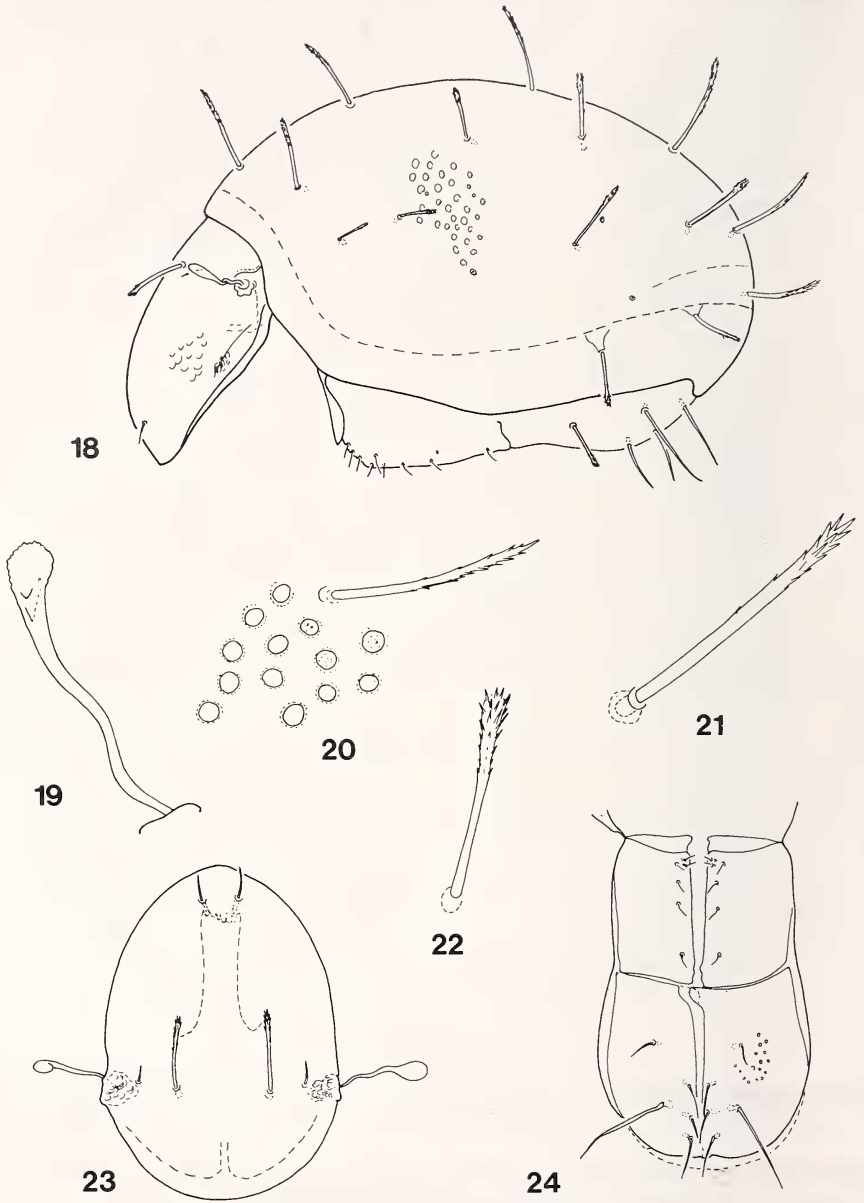
Hoplophorella reducta n. sp. — 14: lateral side, 15: seta c_2 , 16: aspis, 17: anogenital region.

exobothridial one same as rest. Sensillus also short, capitulum clavate, rounded. Aspis with rather fine sculpture comprising well discernible foveolae.

N o s t o g a s t e r (Fig. 14): Sculpture weak. 14 pairs of very rigid, thick, long and heavily ciliate notogastral setae (Fig. 15) present, length-differences among them significant.

A n o g e n i t a l r e g i o n (Fig. 17): All three pairs of adanal setae almost entirely reduced, on the other hand, the two anal ones extraordinarily robust and long.

M a t e r i a l e x a m i n e d: Holotype: Mau-75/58; MHNG.



FIGS 18-24.

Hoplophthiracarus atypicus n. sp. — 18: lateral side, 19: sensillus, 20: seta h_2 , 21: seta in , 22: seta d_2 , 23: aspis, 24: anogenital region.

Remarks: The relegation of the new species in this genus is not unequivocal, since no other representative of *Hoplophorella* Berlese, 1923 exhibits such reduced set of adanal setae. On the other hand, on the basis of one single specimen the erection of a new genus is unjustified.

***Hoplophthiracarus atypicus* n. sp.**

Measurements: Length of aspis: 252-267 μm , length of notogaster: 495-544 μm , height of notogaster: 317-322 μm .

Aspis (Fig. 23): Among setae of aspis that of erectilis lamellaris comparatively short and enclosing an acute angle with surface. Both rostral and interlamellar setae well developed, no significant length differences existing. Sensillus (Fig. 19) with very long petiole, bent like an S, capitulum clavate.

Notogaster (Fig. 18): 15 pairs of rigid, straight notogastral setae present, c_3 and cp much shorter and thinner than others. Their distal end ciliate, sometimes somewhat dilated, may bear long cilia. Sculpture of notogaster (Fig. 20) comprising large foveolae, encircled by tiny punctures, including some granules.

Anogenital region: Adanal setae of various types, ad_3 similar to notogastral ones, ciliate, ad_2 bent basally and very long, though smooth. Anal setae significantly shorter than ad_1 .

Material examined: Holotype: Mau-75/5, 1 paratype collected together with holotype, 1 paratype: Mau-75/58. Holotype and 1 paratype: MHNG, 1 paratype (616-PO-81): HNHM.

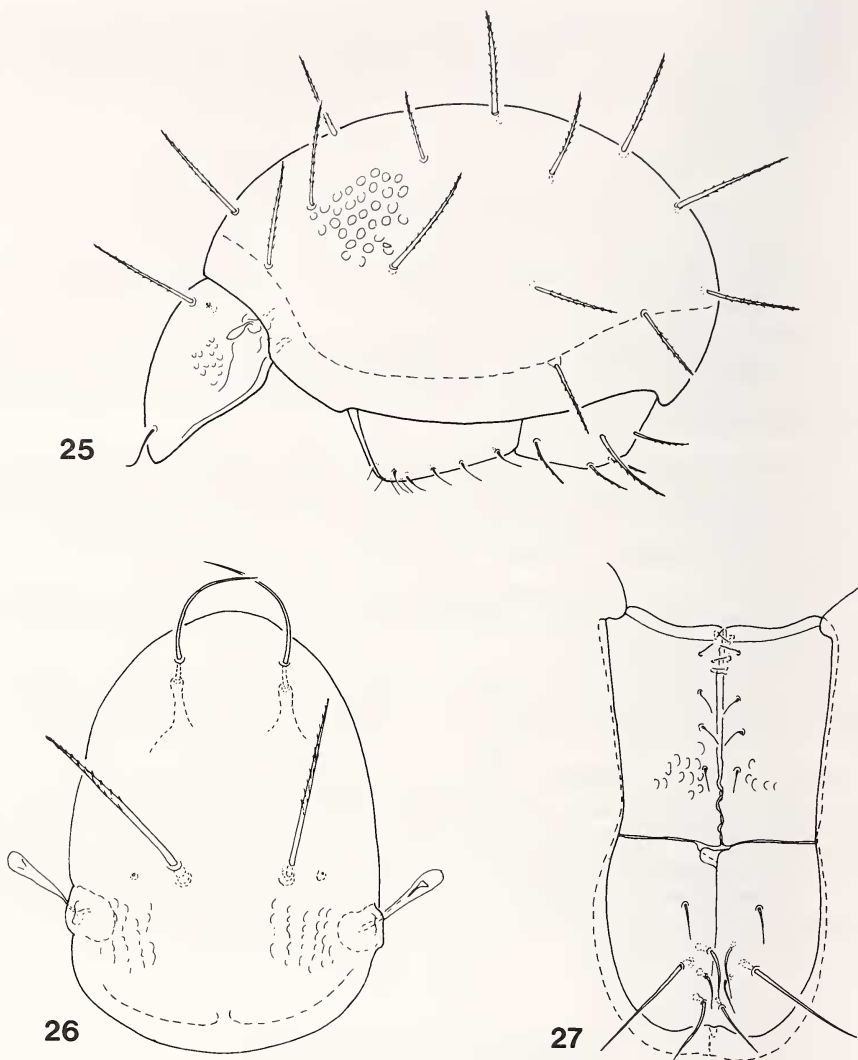
Remarks: The relegation of the new species presented some problems, since the development of lamellar seta and its position, normally characteristic for the genus, display intermediate states much resembling the similar setae of some species of the genus *Hoplophorella* Berlese, 1923. However, the position of setae on the ano-adanal plate, the shape of sensillus and the general sculpture rather indicate a closer alliance with *Hoplophthiracarus*. The new species can readily be separated from the species of both genera by its setae c_3 and cp .

***Hoplophthiracarus magnus* n. sp.**

Measurements: Length of aspis: 307-337 μm , length of notogaster: 604-678 μm , height of notogaster: 376-435 μm .

Aspis (Fig. 26): Surface with heavy sculpture comprising foveolae, though a triangular area in front of bothridium near the margin smooth. Rostral setae strikingly long, arcuate and crossing each other. Lamellar setae erect, as characteristic for genus, and very long, on the other hand, interlamellar ones entirely reduced, only insertion points recognizable. Sensillus gradually dilated towards distal end, narrow spatulate.

Notogaster (Fig. 25): Heavily chitinized, dark species. Sculpture also strong, comprising large foveolae. 14 pairs of rigid, long and straight notogastral setae present, very similar to lamellar setae, all finely ciliate in whorls. End of setae needle-like, no significant length-differences existing.



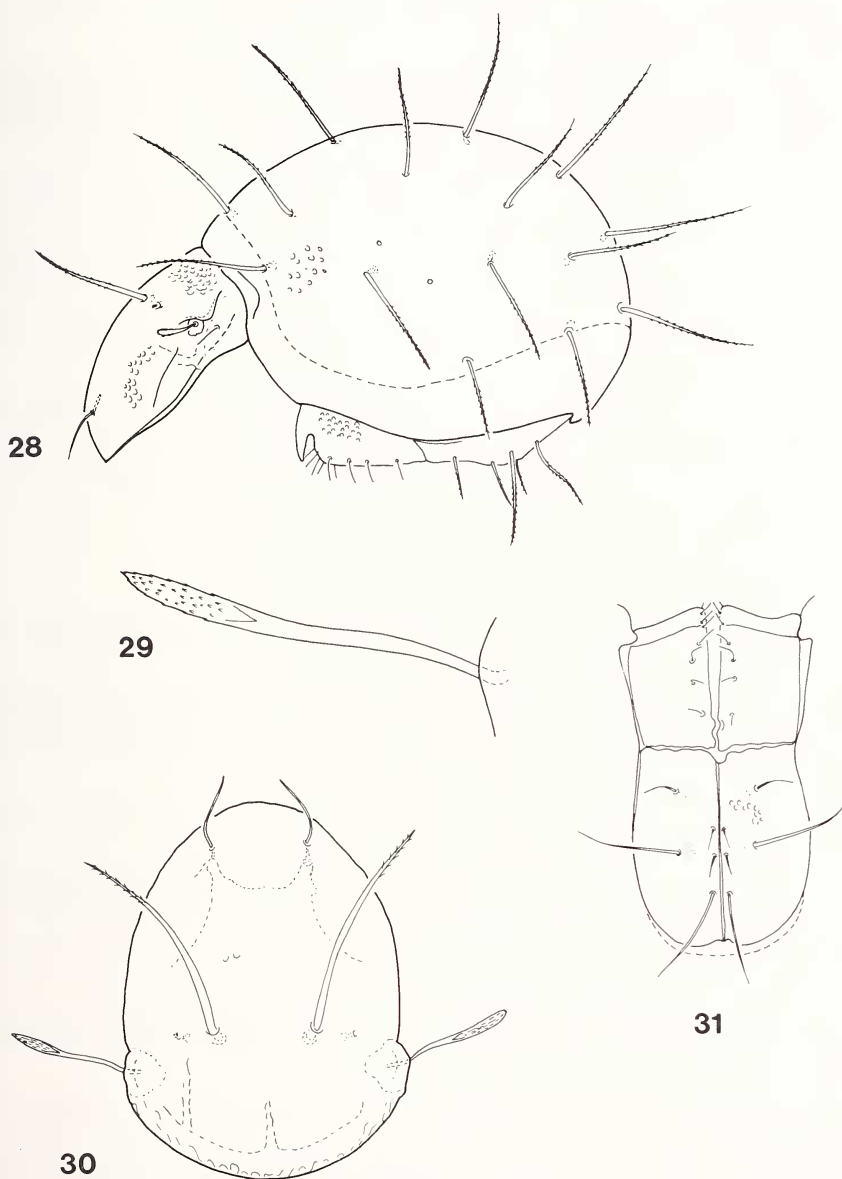
FIGS 25-27.

Hoplophthiracarus magnus n. sp. — 25: lateral side, 26: aspis, 27: anogenital region.

Anogenital region (Fig. 27): Anal setae shorter than any of adanal ones, ad_2 the longest, ad_3 the shortest. Surface bare.

Material examined: Holotype: Mau-75/6, 9 paratypes: collected together with holotype, 13 paratypes: Mau-75/57. Holotype and 14 paratypes: MHNG, 8 paratypes (617-PO-81): HNHM.

Remarks: The new species is readily separable from all other known *Hoplophthiracarus* by its extremely long rostral, wholly reduced interlamellar setae as well as by the shape of sensillus.



FIGS 28-31.

Hoplophthiracarus trichosus n. sp. — 28: lateral side, 29: sensillus, 30: aspis, 31: anogenital region.

Hoplophthiracarus trichosus n. sp.

Measurements: Length of aspis: 292-406 μm , length of notogaster: 535-767 μm , height of notogaster: 332-544 μm .

Aspis (Fig. 30): Erect lamellar setae, characteristic for genus, enormous, interlamellar ones recognizable only by tiny insertion points, setae wholly reduced. Rostral seta normal. Sensillus (Fig. 29) long, thin and thickened only on distal end. Thickened surface finely aciculated. Surface densely packed with well-discernible foveolae.

Notogaster (Fig. 28): Sculpture comprising foveolae somewhat weaker than that of aspis. 14 pairs of large and rigid setae present, all finely ciliate over entire length.

Anogenital region (Fig. 31): Anogenital setae of different lengths: $an_1 < an_2$; $ad_3 = an_1$, but $ad_1 < ad_2$. Anogenital plates with foveolate surface sculpture.

Material examined: Holotype: Mau-75/42, 2 paratypes: collected with the holotype, 1 paratype: Mau-75/5. Holotype and 2 paratypes: MHNG, 1 paratype (618-PO-81): HNHN.

Remarks: Several species of the genus *Hoplophthiracarus* Jacot, 1933 from Africa are known [*H. zebra* (Balogh, 1962⁴) and especially *H. echinus* (Balogh, 1962⁴)], which have rigid and long dorsal setae. But their sculpture is different and the interlamellar pair of setae though short, in all known species quite visible.

Phthiracarus clavifer n. sp.

Measurements: Length of aspis: 183-208 μm , length of notogaster: 312-401 μm , breadth of notogaster: 193-242 μm .

Aspis (Fig. 34): Evenly convex in lateral view, lateral margin gradually narrowing towards rostrum. Rostral and interlamellar setae simple and short, *exa* tiny, on the other hand, lamellar ones extremely long, gradually attenuating, though apex spatulate. Sensillus short, clavate. Entire surface finely punctured.

Notogaster (Fig. 32): All notogastral setae similar to lamellar ones, c_1 significantly longer than d_1 , otherwise no striking length-differences.

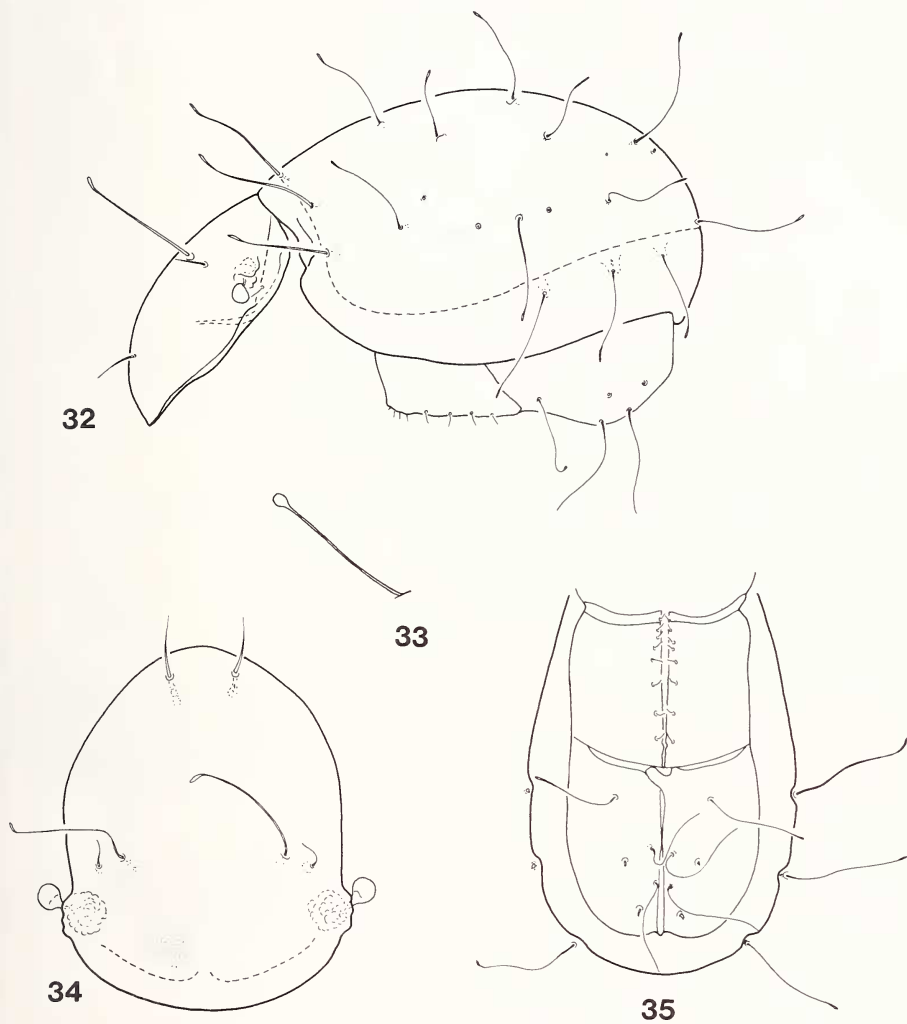
Anogenital region (Fig. 35): Anal setae and ad_3 long and thin, anal setae not thickened, ad_3 resembling notogastral ones. ad_1 and ad_2 represented only by insertion points.

Legs: Femur of leg I with 3 setae, tibia of leg IV without setae.

Material examined: Holotype: Mau-75/58, 2 paratypes: collected together with holotype, 1 paratype: Mau-75/61. Holotype and 2 paratypes: MHNG, 1 paratype (619-PO-81): HNHN.

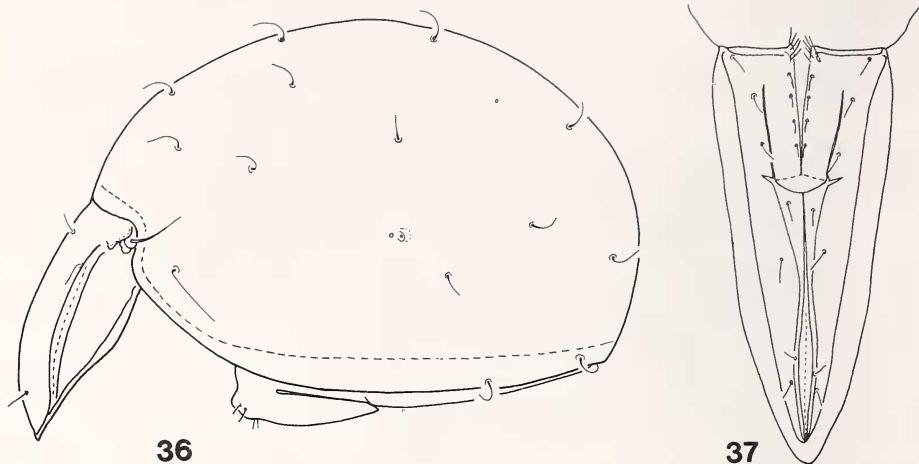
Remarks: The genus *Phthiracarus* Perty, 1839 included only one species with similar type of setae, *Phthiracarus hamatus* Hammer, 1973, described from Tongatapu (a species also found in this material!), but this species belongs to *Archiphthiracarus* Balogh et Mahunka, 1979, and has further setae shorter and the sculpture of foveolae on front of rostrum missing.

⁴ *Hoplophorella zebra* Balogh, 1962 and *H. echinus* Balogh, 1962 = *Hoplophthiracarus zebra* (Balogh, 1962) **comb. n.** and *Hoplophthiracarus echinus* (Balogh, 1962) **comb. n.**



FIGS 32-35.

Phthiracarus clavifer n. sp. — 32: lateral side, 33: seta *in*, 34: aspis, 35: anogenital region.



FIGS 36-37.

Indotritia krakatauensis (Sellnick, 1923) — 36: lateral side, 37: anal plate.

***Philotritia* n. gen.**

D i a g n o s i s : Family Oribotritiidae. Bothridial scale situated above bothridium. Aspis with two lateral carinae on either side. 14 pairs of notogastral setae present. Fissure separating genital and aggenital plates. 3 pairs of adanal, no anal setae. Tarsi tridactylous. Palp 4-segmented. Two setae on palpal femur and two setae on palpal tibia. Tarsus of leg IV with a spiniform seta (*h*).

T y p e - s p e c i e s : *Philotritia spinosa* n. sp.

R e m a r k s : In the family Oribotritiidae the new genus stands closest to *Oribotritia* Jacot, 1924, but differs from latter by its 4-segmented palp, anal setae missing and by the strongly thickened seta of tarsus on leg IV.

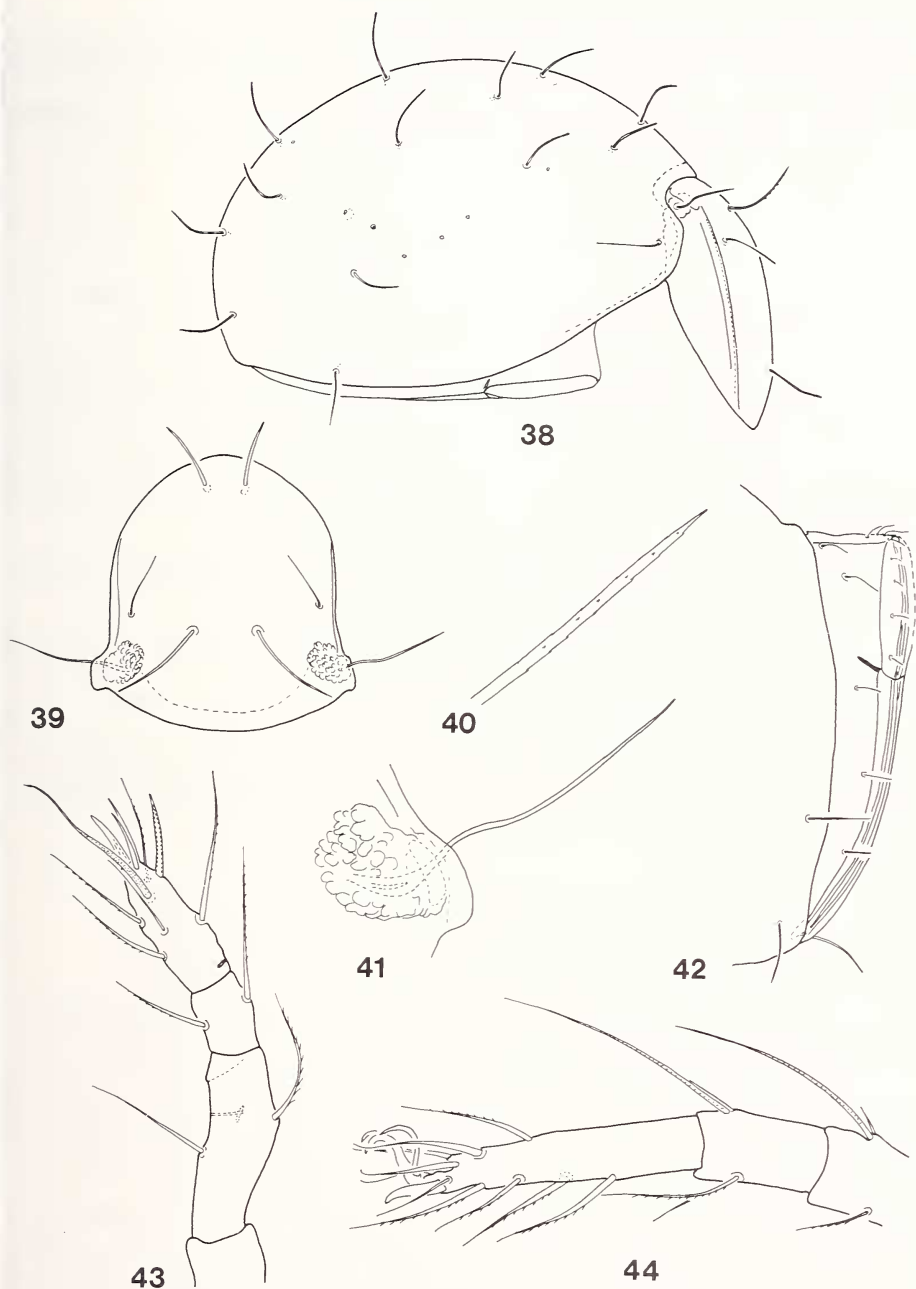
***Philotritia spinosa* n. sp.**

M e a s u r e m e n t s : Aspis: 297-396 μm , length of notogaster: 544-609 μm , breadth of notogaster: 371-426 μm .

A s p i s (Fig. 39): Evenly convex in lateral view. On rostral part finely reticulated. Two lateral carinae present, upper one well developed, lower carina almost linear and short. Setae of aspis of various types, *ro* and *in* thicker, needle-like, *le* piliform. *exa* represented only by insertion points. Sensillus thin, setiform and roughened.

N o t o g a s t e r (Fig. 38): 14 pairs of notogastral setae present, *c*₃ and *ps*₃ strongly resembling *le*, very fine and thin, others stronger and needle-like.

L e g s : All legs with three claws. Seta *h'* of tarsus on leg IV spiniform (Fig. 44).



FIGS 38-44.

Philotritia spinosa n. gen., n. sp. — 38: lateral side, 39: aspis, 40: end of sensillus, 41: sensillus, 42: anogenital region, 43: palp, 44: leg IV.

Material examined: Holotype: Mau-75/60, 11 paratypes: with the same data as for holotype, 4 paratypes: Mau-75/5. Holotype and 9 paratypes: MHNG, 6 paratypes (620-PO-81): HNHM.

Remarks: The new species is strongly resembling *Indotritia* Jacot, 1929 species but may be readily separated by its genital and aggenital plates.

***Microtritia ethiopica* sp. n.**

Measurements: Length of aspis: 178-197 μm , length of notogaster: 322-336 μm , height of notogaster: 206-238 μm .

Aspis (Fig. 46): Inner margin of rostrum with well discernible teeth. Laterally with a strong carina, comparatively large foveolae well discernible on basal part. Rostral setae originating rather far from rostrum on surface of aspis, set close to each other. Lamellar setae of similar length, very close to each other, also close to rostral ones and far from interlamellar setae. Interlamellar and exobothridial setae tiny, scarcely distinguishable. Sensillus very long, setiform, though somewhat fusiformly thickened and finely ciliate.

Notogaster (Fig. 45): 14 pairs of thin, mostly bent notogastral setae present. Surface with very weak sculpture of hardly recognizable foveolae.

Anogenital region: Anal setae tiny, scarcely perceptible. ad_1 and ad_2 long and robust, ad_3 much shorter.

Material examined: Holotype: Mau-75/28, 3 paratypes: collected with the holotype. Holotype and 2 paratypes: MHNG, 1 paratype (621-PO-81): HNHM.

Remarks: The new species stands closest to *Microtritia tropica* Märkel, 1964. But the rostrum of latter is entirely smooth, the sensillus comparatively short and furthermore, the strong foveolae also missing on basal part of aspis.

***Dolicheremaeus plurisetus* n. sp.**

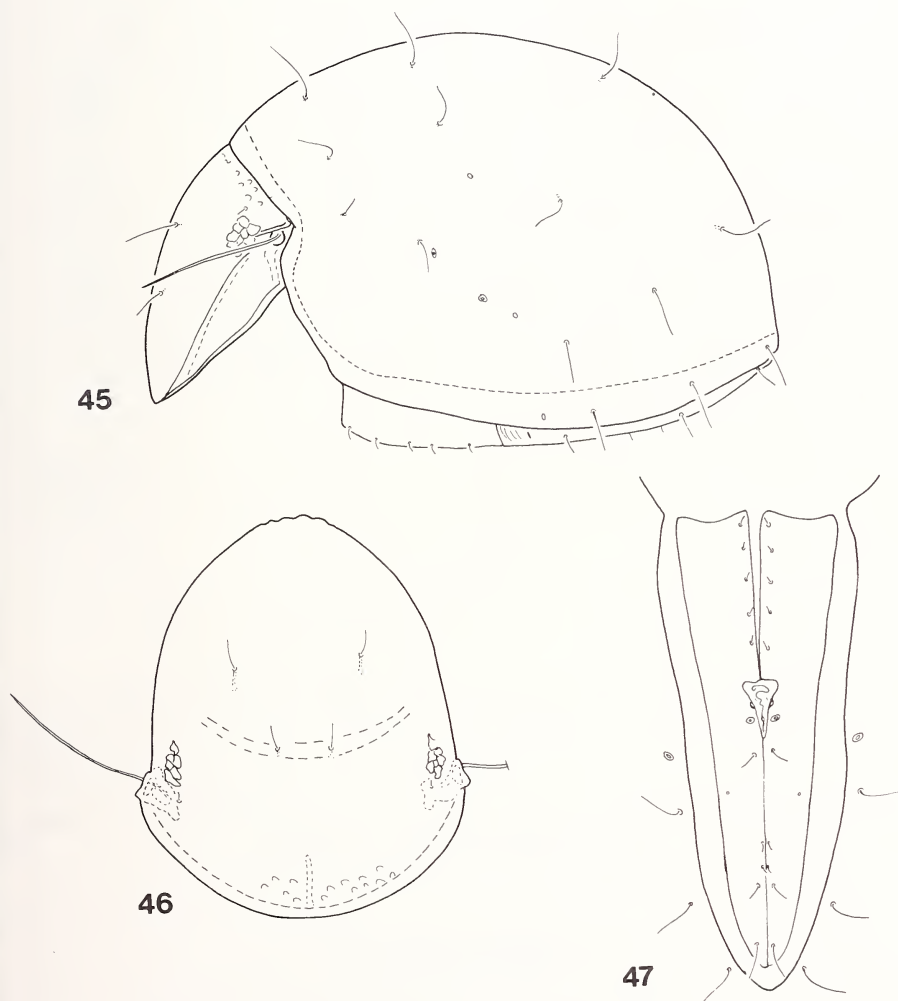
Measurements: Length: 668-723 μm , breadth: 297-327 μm .

Dorsal side (Fig. 48): Surface of prodorsum, excepting interlamellar region, finely punctate, interlamellar region with 8-9 pairs of rows comprising weak foveolae. Lamellae long, somewhat surpassing insertion points of rostral setae. Sensillus (Figs 50-51) long, fusiformly thickened with an elongate sharp apex. Condyls in prodorsum as well as on anterior margin of notogaster very large and standing singly. 14 pairs of notogastral setae present, all aciculiform, finely ciliate. Medial setae and those emitted in anterior part of notogaster much shorter than rest, without significant length-differences among them.

Ventral side (Fig. 49): Epimeral setal formula: 3-1-3-3. All epimeral setae ciliate, medial setae shorter, lateral ones longer. Genital plates dark in colour, strongly contrasting that of ventral plate. 4 pairs of thin genital, 1 pair of aggenital, 2 pairs of long anal and 3 pairs of marginally situated adanal setae present. ad_2 longer than other two. Pori *iad* parallel with margin of anal opening.

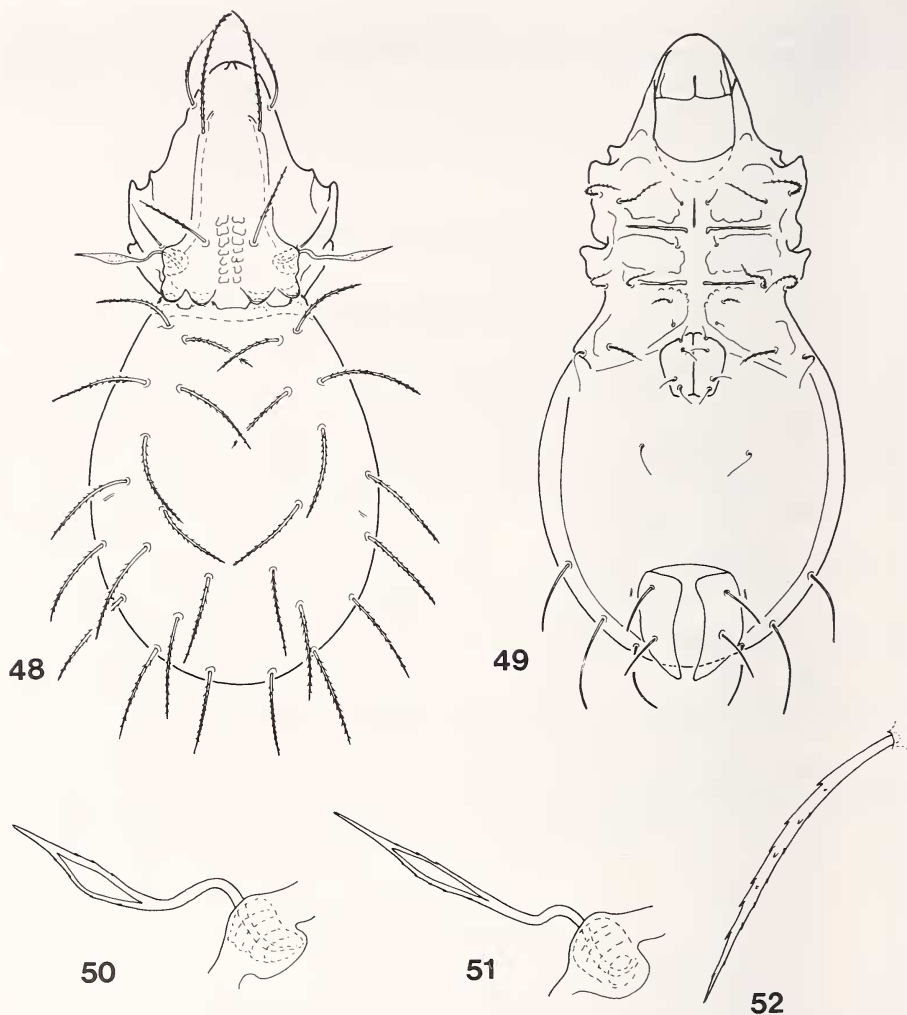
Material examined: Holotype: Mau-75/58, 4 paratypes: collected with the holotype. Holotype and 2 paratypes: MHNG, 2 paratypes (622-PO-81): HNHM.

Remarks: The new species belongs to the species-group having 14 pairs of notogastral setae. So far not many species have been discovered (e.g. *D. nepalensis* Aoki, 1967), the new one differs from them by the shape of its sensillus and the extremely large condyli.



FIGS 45-47.

Microtrititia ethiopica n. sp. — 45: lateral side, 46: aspis, 47: anal plate.



FIGS 48-52.

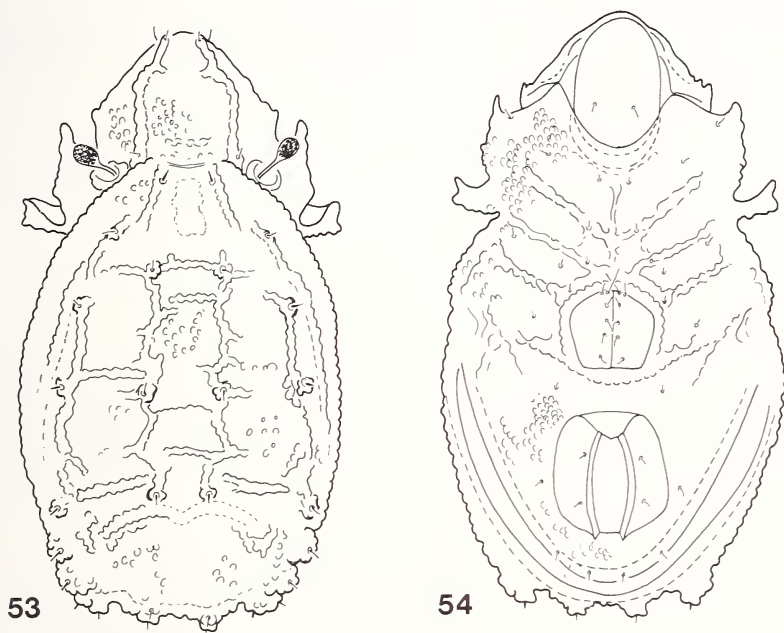
Dolicheremaeus plurisetus n. sp. — 48: dorsal side, 49: ventral side, 50: sensillus of the holotypus, 51: sensillus of paratypus, 52: seta *te*.

***Arthrovertex xena* sp. n.**

M e a s u r e m e n t s : Length: 569-619 μm , breadth: 307-351 μm .

D o r s a l s i d e (Fig. 53): Prodorsal surface with tuberculi and short laths composed of tuberculi. Lamellae narrow but very long, reaching anterior margin of rostrum, no translamella present. Petiole of sensillus long. Surface of notogaster with longitudinal

and transversal sclerotized laths and also with tuberculi. 14 pairs of notogastral setae present, all short and spiniform. In posterior part of body laths missing, here surface concave. Though marginally with some 5-6 larger tuberculi, posteromarginal setae originating on the latter.



FIGS 53-54.

Arthrovertex xena n. sp. — 53: dorsal side, 54: ventral side.

Ventral side (Fig. 54): Surface with tuberculi becoming smaller towards mid body. Apodemes well developed. Ventral plate limited by a thick and dark chitinized lath emitting ad_1 and ad_2 . 6 pairs of genital, 1 pair of aggenital, 2 pairs of anal and 3 pairs of adanal setae present.

Legs: All legs with three claws, median claw much thicker and longer than lateral ones.

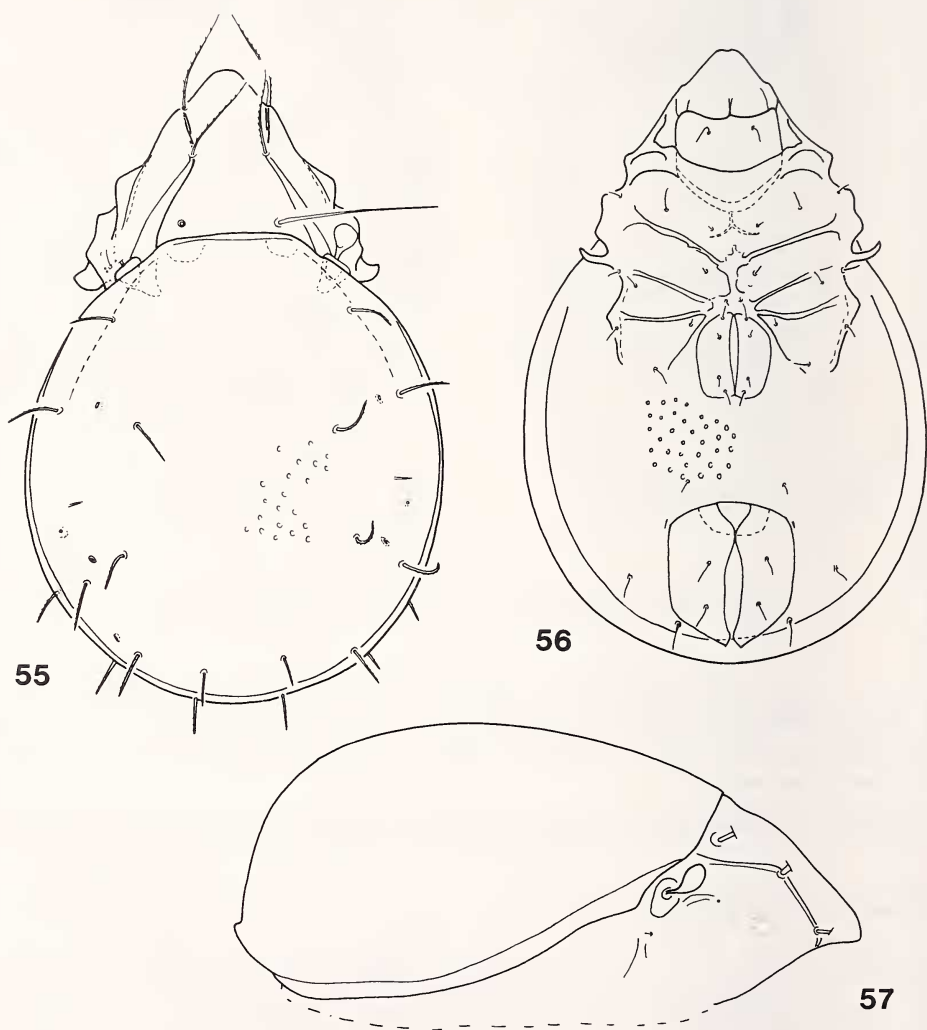
Material examined: Holotype: Mau-75/40, 1 paratype: Mau-75/60. Holotype: MHNG, paratype (623-PO-81): HNHM.

Remarks: The genus *Arthrovertex* Balogh, 1970 so far includes one species from the Philippines (*A. ilocamus* Corpus-Raros, 1979) and one from Central America (*A. baloghi* Mahunka, 1978). The latter is very similar to the new species, on the other hand, the assignment of the new species and the one from the Philippines is rather problematic. But since the course of apodemes and position of the setae and the shape of claws indicate relationship with *A. ilocamus*, it would at present be better to keep it in *Arthrovertex* than to move it into the also closely allied *Scapheremaeus* Berlese, 1910.

Aellenobates sculpturatus n. sp.

Measurements: Length: 416-426 μm , breadth: 262-272 μm .

Dorsal side (Fig. 55): Lamellae thin, strongly converging, prolamella present. Rostral and lamellar setae emitted on these, simple, setiform. Interlamellar seta similar but much longer. Sensillus short, clavate. Pteromorpha very small, like a humeral scale, 10 pairs of thick, needle-like, finely ciliate notogastral setae present. Four pairs of tiny sacculi. Notogastral surface adorned with foveolae.



FIGS 55-57.

Aellenobates sculpturatus n. sp. — 55: dorsal side, 56: ventral side, 57: lateral side.

Ventral side (Fig. 56): Apodemes well developed. Epimeral setal formula: 3-1-3-3. All setae thin. Four pairs of genital setae present, aggenital ones missing. Two pairs of anal and 3 pairs of adanal setae somewhat thickened. ad_3 placed well in front of anal opening.

Legs: All legs with three claws, heterodactylous.

Material examined: Holotype: Mau-75/61, 1 paratype: same data as for Holotype. Holotype: MHNG, paratype (624-PO-81): HHNM.

Remarks: Owing to the shape of the body, the position of notogastral and ventral lateral setae, the new species can safely be assigned to the genus *Aellenobates* Mahunka, 1978, though the pteromorpha of latter is much bigger and the bothridium covered in dorsal aspect. Further differences exist between the two species in the sculpture and in the length of setae.

Berndia n. gen.

Diagnosis: Family Oribatulidae. Lamella and in its continuation prolamella developed, both lamellar and rostral setae originating on these. Bothridium uncovered. Pteromorpha undeveloped, like a humeral scale. Notogaster with upturned margin. 13 pairs of needle-like, robust notogastral setae and 4 pairs of small sacculi present. Epimeral setal formula: 3-1-3-2. Four pairs of genital, no aggenital, 2 pairs of anal and 3 pairs of adanal setae present. Legs with three claws, heterodactylous.

Type-species: *Berndia setosa* n. sp.

Remarks: Owing to the habitus of the taxon and its missing pair of aggenital setae, it might be related with *Aellenobates* Mahunka, 1978, but the latter has 10 pairs of notogastral setae and pteromorpha covering bothridium. The group of genera having 13 pairs of notogastral setae also has aggenital setae, consequently the erection of a new genus was necessary.

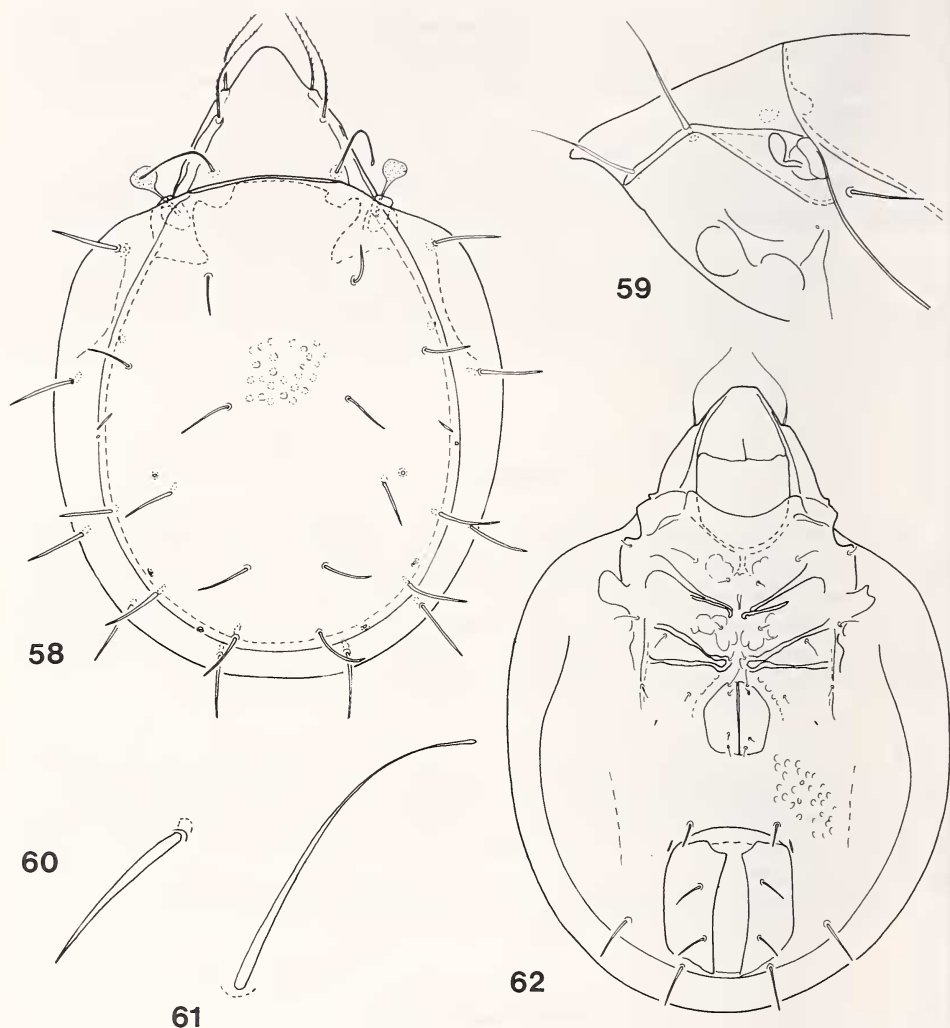
I dedicate this new taxon to my dear friend Dr. Bernd Hauser (Geneva).

Berndia setosa n. sp.

Measurements: Length: 351 μ m, breadth: 272 μ m.

Dorsal side (Fig. 58): Rostrum rounded, rostral setae originating on a well developed prolamella laterally (Fig. 59). Lamellar seta originating on lamellar surface, no separate cuspis present, both pairs of setae simple and setiform. Interlamellar seta long, distal end capitate like a pin (Fig. 61). Sensillus short, strongly dilated, claviform, surface aciculate. Pteromorpha resembling a humeral scale, immobile. Notogastral surface laterally limited by well discernible margin. In lateral view notogastral margin somewhat upcurving, similarly to that of *Aellenobates* Mahunka, 1978. 13 (!) pairs of thick, needle-like notogastral setae (Fig. 60) present.

Ventral side (Fig. 62): Apodemes well developed, 3rd and sejugal apodemes in the middle confluent just in front of genital opening. Epimeral setae thin and straight. Four pairs of thin genital and no aggenital setae present. Two pairs of anal and 3 pairs



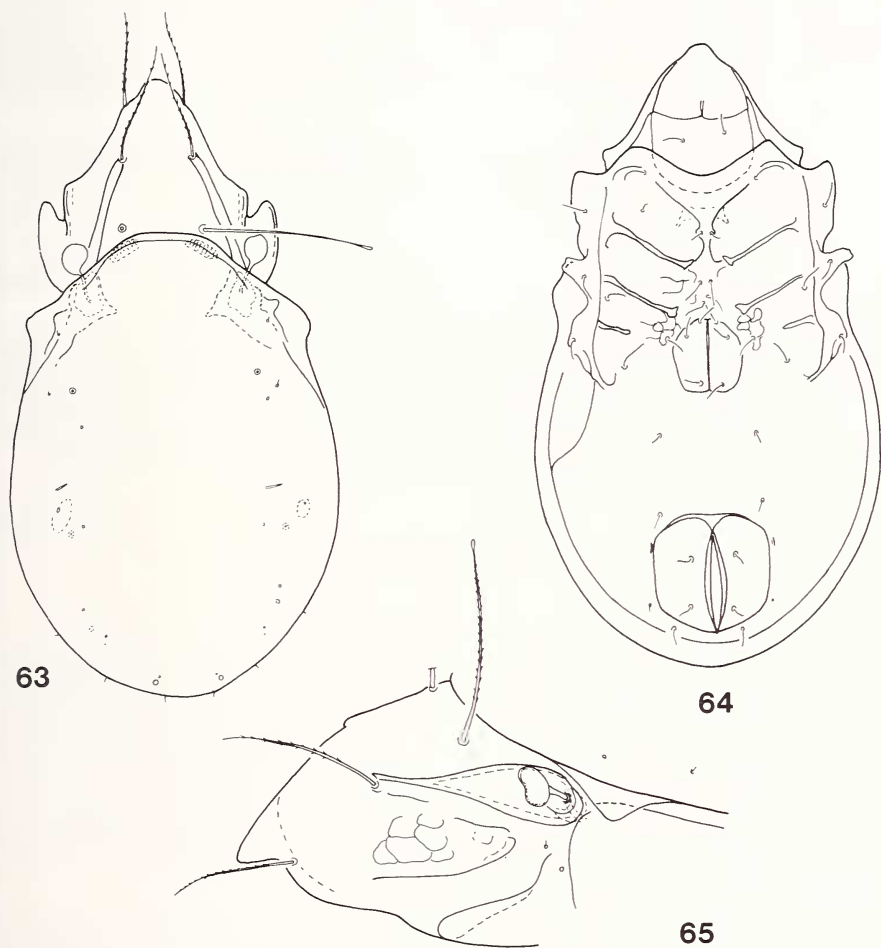
FIGS 58-62.

Berndia setosa n. gen., n. sp. — 58: dorsal side, 59: lateral part of prodorsum, 60: seta *ti*, 61: seta *in*, 62: ventral side.

of adanal setae, similar to those originating on notogaster. *ad*₃ in peranal position. Anogenital region with similar sculpture as notogaster.

Material examined: Holotype: Mau-75/61, 1 paratype: Mau-75/60. Holotype: MHNG, paratype (625-PO-81): HNHM.

Remarks: The species is quite singular within the family Oribatulidae as specified in the generic diagnosis.



FIGS 63-65.

Euscheloribates clavisetus n. sp. — 63: dorsal side, 64: ventral side, 65: lateral part of prodorsum.

***Euscheloribates clavisetus* n. sp.**

Measurements: Length: 336-356 μm , breadth: 172-188 μm .

Dorsal side (Fig. 63): Rostrum elongate, both rostral and lamellar setae thin, setiform and ciliate. Rostral setae originating on surface of prodorsum. Lamellae short with weak cuspis (Fig. 65). Interlamellar seta very long, distal end capitate as a pin. Bothridium covered in dorsal aspect. Sensillus with clavate short head. Pteromorphae squamiform, small. 10 pairs of scarcely discernible notogastral setae and 4 pairs of tiny sacculi present.

Ventral side (Fig. 64): Epimeral setal formula: 3-1-3-3. Three pairs of thin genital, 1 pair of aggenital, 2 pairs of anal and 3 pairs of adanal setae present. ad_3 in preanal position.

Legs: With one claw.

Material examined: Holotype: Mau-75/58, 2 paratypes: collected together with the holotype. Holotype and 1 paratype: MHNG, 1 paratype (626-PO-81): HHNM.

Remarks: On the basis of the number of setae in the anogenital region and on the basis of the claw, the new species should be placed into the Palaearctic genus *Euscheloribates* Kunst, 1958. But the shape of the body and the size of the pteromorpha are so widely different from those of the type of this genus that this assignment is rather dubious. Final decision can only be made after the revision of the entire group.

***Scheloribates schauenbergi* n. sp.**

Measurements: Length: 435-480 μm , breadth: 242-297 μm .

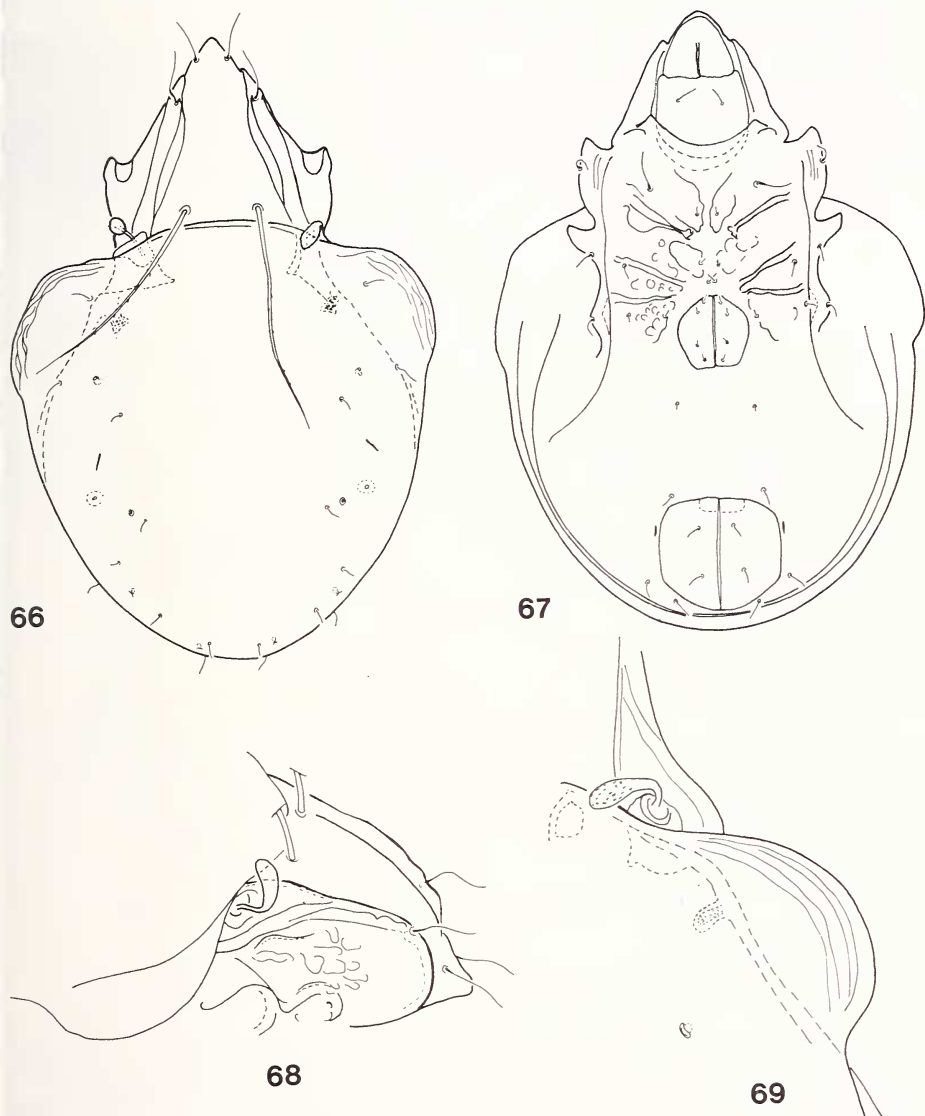
Dorsal side (Fig. 66): Rostrum somewhat elongate, though rounded on front. Lamellae strongly developed, broad; even prolamella similarly developed, in lateral view (Fig. 68) connected as a continuous arcuate line with marginal line of prodorsum. Rostral and lamellar setae very thin, comparatively short, latter originating on lamellae from a small sinus. Interlamellar setae extremely long (178 μm), almost half length of body. Sensillus short, claviform, usually strongly recurving. Pteromorphae well developed, margin with creases. Areae porosae adalares most peculiar, sacculiform, deeply invaginated into body (Fig. 69). Four pairs of small sacculi and 10 pairs of very thin, scarcely distinguishable notogastral setae.

Ventral side (Fig. 67): Epimeral setal formula: 3-1-3-3. Seta *1b* much longer than rest, *1c* originating from margin of tectopedia 1-2. Four pairs of tiny genital, 1 pair of aggenital, 2 pairs of anal and 3 pairs of adanal setae present, ad_3 in preanal position.

Legs: Tridactylous. Femora in lateral view almost round, femora 2-4 with strong ventral carina.

Material examined: Holotype: Mau-75/58, 17 paratypes: from the same sample, 3 paratypes: Mau-75/61. Holotype and 12 paratypes: MHNG, 8 paratypes (627-PO-81): HHNM.

Remarks: The genus *Scheloribates* Berlese, 1908 comprises species having extremely long interlamellar setae. The new species is readily separable from all the other congeners by its most peculiar, sacculiform areae porosae adalares and the very wide lamellae.



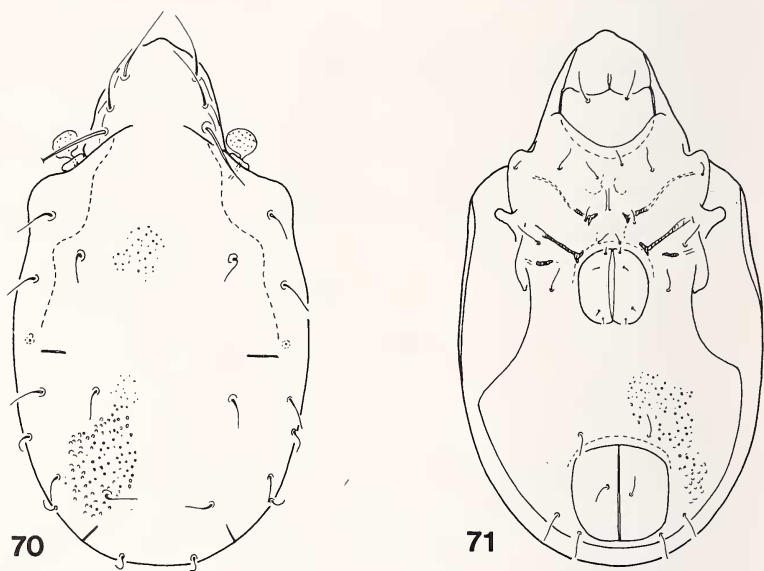
FIGS 66-69.

Schelorbates schauenbergi n. sp. — 66: dorsal side, 67: ventral side, 68: lateral part of prodorsum, 69: sensillus and pteromorpha.

***Brachyoripoda minima* n. sp.**

Measurements: Length: 228-237 μm , breadth: 127-139 μm .

Dorsal side (Fig. 70): Rostrum convexly rounded. Rostral setae removed from each other and from lamellar setae, placed laterally. Lamellae short but well separable. Rostral, lamellar and interlamellar setae of same type: setiform and robust. Interlamellar ones the longest. Prodorsal surface finely punctate. Dorsosejugal suture interrupted in the middle. Sensillus free, "head" large, foveolate. Notogaster with surface sculpture becoming gradually coarser towards caudal end. Ten pairs of thin and simple notogastral setae present, much shorter than prodorsal ones.



FIGS 70-71.

Brachyoripoda minima n. sp. — 70: dorsal side, 71: ventral side.

Ventral side (Fig. 71): Entire surface, excluding mentum, foveolate. Foveolae becoming larger and deeper towards caudal end, but sculpture not so coarse as on dorsal side. Apodemes short, weakly developed, longitudinal sternal apodeme missing as in generotype, epimeres open. Epimeral setal formula: 3-1-2-1, no significant length differences existing among setae. Four pairs of tiny genital, 1 pair of anal and 3 pairs of adanal setae present, latter comparatively long. Aggenital setae ⁵ missing.

⁵ The presence or absence of aggenital setae (see AOKI & OHKUBO 1974: p. 143) has been studied on the type specimen of the generotype. I may unequivocally say that one pair of aggenital setae are present.

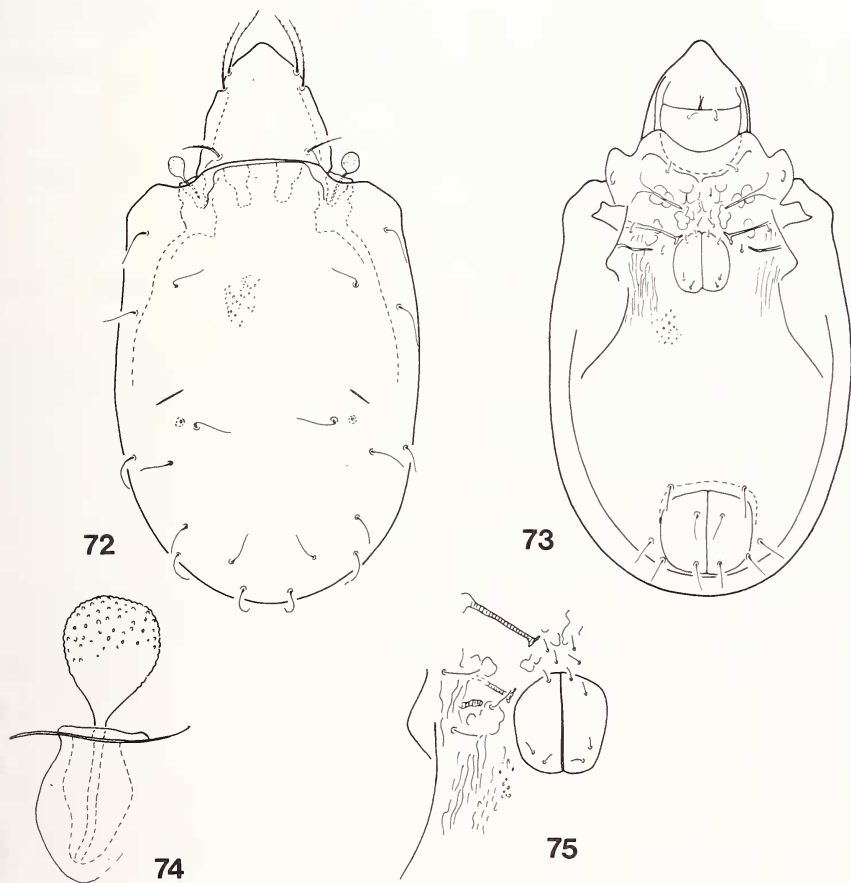
Legs: Both available specimens are much damaged, most of the legs are missing, only two legs bear one claw each.

Material examined: Holotype: Mau-75/40, 1 paratype: collected with the holotype. Holotype: MHNG, paratype: HHNM.

Remarks: The genus *Brachyoripoda* Balogh, 1970 is known on the basis of its type-species only. This single type-specimen is quite similar to the new species, but it is bigger ($332 \times 202 \mu\text{m}$) and its rostrum has laterally an incision on either side, furthermore, its ventral sculpture is wholly different. Consequently, the two species can easily be separated from each other.

***Protoripoda lineata* n. sp.**

Measurements: Length of female: 445-475 μm , that of male: 366-396 μm , breadth of female: 223-267 μm , that of male: 193-218 μm .



FIGS 72-75.

Protoripoda lineata n. sp. — 72: dorsal side, 73: ventral side, 74: sensillus, 75: genital region.

Dorsal side (Fig. 72): Rostrum like a nose. Lamellae robust, well separated marginally, only rudiments of translamella perceptible. Setae of prodorsum strong, much thicker and robuster than those of notogaster, among them lamellar ones the longest. Sensillus (Fig. 74) clavate, surface coarsely aciculate. Dorsosejugal suture weakly concave. Notogastral surface similarly to that of prodorsum with scattered small foveolae. Ten pairs of thin notogastral setae present.

Ventral side (Fig. 73): Sculpture variable, mentum with fine foveolae, central part of epimeral region with irregular areae, while in the centre and behind of anogenital region with foveolae, though beside genital opening foveolae forming longitudinal furrows accompanied with creases which sculpture extending over lateral parts of epimeres too. Epimeral setal formula: 3-1-2-3, all setae thin and short. Four pairs of small genital (Fig. 75), 1 pair of tiny aggenital, 2 pairs of anal and 3 pairs of adanal setae present. Anal and adanal setae thick, needle-like and finely aciculate.

Legs: Tarsi with three claws of equal length.

Material examined: Holotype: Mau-75/40, 3 paratypes: collected with the holotype. Holotype and 2 paratypes: MHNG, 1 paratype (629-PO-81): HHNM.

Remarks: For differential diagnosis compare the remarks to the following *Protoripoda* species.

***Protoripoda tuberculata* n. sp.**

Measurements: Length of female: 396-431 μm , that of male: 292 μm , breadth of female: 203-243 μm , that of male: 173 μm .

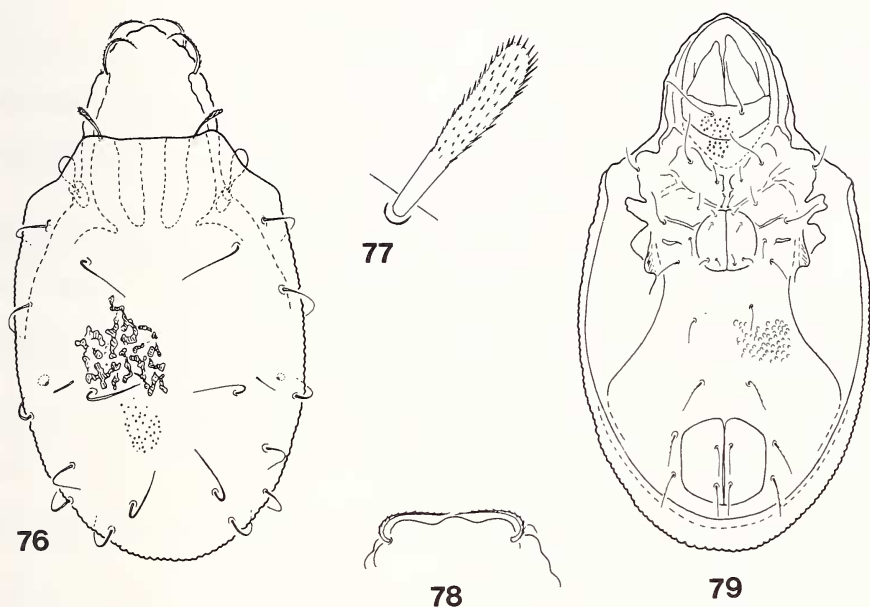
Dorsal side (Fig. 76): Body integument foveolate and covered with polygonal sculpture of secretion. Rostrum rounded and convex (Fig. 78). Lamellae arranged marginally, well separated, cuspis broad. Among prodorsal setae, rostral and lamellar pairs setiform, verticillately ciliate. Interlamellar seta (Fig. 77) phylliformly broadened towards distal apex, ciliae arranged in longitudinal rows. Anterior margin of notogaster undulately concave. Sensillus almost entirely covered, rounded, surface roughened. 10 pairs of robust and long notogastral setae present, setae p_1 - p_3 significantly shorter than rest.

Ventral side (Fig. 79): Entire surface including mentum as well as genital and anal plates foveolate. Epimeral setal formula: 3-1-2-2. Epimeral setae displaying significant length differences, some (*1b*, *3b*) flagelliform. Four pairs (occasionally on one side only 3!) of short genital, 1 pair of aggenital, 2 pairs of anal and 3 pairs of adanal setae present. Anal and adanal setae long and robust, though not flagelliform. Ventral setae mostly well perceptibly ciliate.

Legs: All tarsi with three claws, medial claws scarcely stronger than lateral ones, latter on inner margin with a subapical incision, medial one smooth throughout. All tibiae with extremely long solenidium ϕ_1 , leg I ending filiformly, others ending scapularly.

Besides the differences in measurements the two sexes are very similar, only the course of apodemes varies slightly!

Material examined: Holotype: Mau-75/40, 3 paratypes: collected with the holotype. Holotype and 2 paratypes: MHNG, 1 paratype (630-PO-81): HHNM.



FIGS 76-79.

Protoripoda tuberculata n. sp. — 76: dorsal side, 77: seta *in*, 78: rostrum, 79: ventral side.

R e m a r k s. The species belonging in the genus *Protoripoda* Balogh, 1970 may be separated by the following key.

- 1 (2) Interlamellar setae strongly broadened. Surface of notogaster covered by a polygonal pattern of secretion granules..... *tuberculata* n. sp.
- 2 (1) Interlamellar setae simple, setiform. Surface of notogaster without a polygonal pattern
- 3 (4) Lamellae broad running along margin of prodorsum. Epimeral region with longitudinal creases..... *lineata* n. sp.
- 4 (3) Lamellae narrow, prodorsal margin free. Epimeral region without longitudinal creases.
- 5 (6) Body surface smooth. Rostrum narrow, protruding like a nose from anterior margin of prodorsum. Anoadanal region with very long and arcuate setae..... *insularis* Balogh, 1970
- 6 (5) Body surface with large foveolae. Rostrum broadly rounded. Anoadanal region with short and straight setae..... *woolleyi* Balogh, 1970

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